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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

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COMPLETE THE RECORD

The Plant Disease Survey exists to collect, record, and preserve information regarding the occurrence of plant diseases in the United States for the current and future use of those to whom it may be of importance. The value and adequacy of such records are directly proportional to their accuracy and completeness. A record of the absence or of the relative rarity of a specific disease in a given locality in a given year may be quite as significant to the investigator at some future date as an early record of its occurrence.

The sudden appearance of downy mildew of tobacco in 1931 after its first alarming outbreak and prompt disappearance ten years earlier, and the recurrence of Stewart's disease of corn on Long Island after an interval of thirty-five years raise questions regarding the incidence, disappearance, and recurrence of plant diseases which challenge attention. The apparent waning of these diseases this year, in some areas at least, tends to emphasize the importance of making currently, complete and accurate records of disease occurrence as part of the data required in an analysis of the factors which regulate outbreaks. The severity of the past winter over much of the United States and the long continued drought of the present summer are without question modifying the occurrence and distribution of plant diseases.

In order that the facts may be available for any who require them in the future, the Survey earnestly requests all its collaborators to report conditions coming under their observation. All reports whether used in the Reporter or not are placed in the permanent files which are always available for examination and study. General and systematic cooperation is solicited.

H. A. Edson.

PLANT DISEASES IN MINNESOTA

Reported by the Department of Plant Pathology (June 26).

The effects of the severe drought, heat, wind, and dust storms have almost obliterated the plant disease picture in Minnesota this season. As far as cereal diseases are concerned, traces of the pycnial stage of Puccinia graminis were found in Fillmore County May 21. This is about three weeks later than their normal appearance. A few mature aecia were found in Olmstead County May 31. New barberry infections have been found since the rains in early June. The uredinial stage was just beginning to appear in the Minnesota Valley June 22 on spring wheat and oats. Leaf rust (Puccinia triticina = P. rubigo-vera tritici) was found on winter wheat June 13 in Goodhue County. The usual amout of loose smut (Ustilago tritici) seems to be present on wheat. It is still too early to tell about the smuts of other cereals.

On fruits, apple scab (Venturia inaequalis) has not yet been reported, although ascospores were mature in sheltered locations as early as April 25. Presumably as a result of the hot weather, severe injury was caused by the calyx spray in one orchard. About 30 per cent of the fruit was badly burned, although the foliage was injured but little except on the varieties Yankee and Duchess. Most of the injury occurred on the southwest side of the trees. In the vicinity of Minneapolis apple trees near cedar hedges are thus far free from rust (Gymnosporangium), although normally they are heavily infected at this time. Cedar galls are very scarce. Wind and dust storms during the flowering period reduced the set of apples at least 50 per cent.

Small fruits suffered severely from winter injury. In many plantings 50 per cent of the raspberry plants were completely killed, and many others weakened. It is estimated that 25 to 30 per cent of a normal crop will be harvested. Mosaic (virus) and crown gall (Bacterium tumefaciens) may have contributed to the death of the plants, as galls were found on about two thirds of the plants examined this spring. Many plantings of strawberries were completely killed, and others weakened. It is estimated that about 10 per cent of a normal crop will be harvested.

Winter killing was extremely severe on all sorts of perennials. Ornamental shrubs and evergreens did not suffer as much as frequently happens. Around St. Paul Botrytis convoluta Whetzel and Drayton [previously known in New York, Washington, and Ontario; also through quarantine interceptions from Germany, France, and Holland] was found in a number of plantings of Iris resulting in the loss of many plants. The fungus sporulated abundantly during the latter part of March and early April while the plants were still covered. Masses of sclerotia were found later on the roots. So far the disease has been found on about 60 varieties of Iris. Bacterial soft rot (Bacillus carotovorus) has been abundant on Iris since early spring. Only traces of the common Botrytis blight of peonies (B. paeoniae) were found except on very susceptible varieties.

SURVEY FOR DISEASES OF WINTER WHEAT AND WINTER BARLEY IN PENNSYLVANIA

R. S. Kirby (July 9)

WHEAT: Stem rust (Puccinia graminis). As usual there were only a few fields infected with stem rust. Thirteen fields in three counties out of seventy-eight fields in twelve counties were all that were found to be infested. The average percentage of infection was .33.

Twelve out of the thirteen infected fields were in the Lehigh-Northampton County area where barberries may have been responsible for the spread of the rust. The maximum infection in any one field was 15 per cent.

Leaf rust (Puccinia triticina = P. rubigo-vera tritici) was again very generally found and severe. 100 per cent of the seventy-two fields surveyed in twelve counties were infected. The average percentage of infection was 50.

Bunt (Tilletia laevis). A survey in seventy-eight fields in twelve counties shows the following: 40 per cent of the seventy untreated fields were infected. The average infection was 1.3 per cent. The maximum infection was 18 per cent. A trace of stinking smut was found in one field one year from treatment. Not a single head of stinking smut was found in seven fields planted with seed treated with copper carbonate.

Loose smut (Ustilago tritici). An average of 2.4 per cent loose smut was found in seventy-two fields in eleven counties. Loose smut occurred in every field surveyed except one, and that one was from seed treated with hot water. The maximum infection in any one field was 15 per cent. Forward and Leap have in general very little loose smut, Nitney has a moderate amount while Red Rock is generally severely infected.

Scab (Gibberella saubinetii) was of very minor importance in Pennsylvania. This year in seventy-two fields surveyed 57 per cent had some scab infection. An average of 0.3 per cent of the spikelets were infected. The maximum was 10 per cent in a field in which corn was planted in 1933.

Anthracnose (Colletotrichum graminicolum). There was less anthracnose than usual. The average infection was 0.2 per cent. In 11.1 per cent of the fields, anthracnose was found.

Foot rot (Helminthosporium sativum) was found in 2.8 per cent of the fields surveyed. The average infection was 0.05 per cent. The maximum infection in one field was 2 per cent.

Speckled leaf blotch (Septoria tritici). Leaf spot was more generally found in 1934 than for several years. It was found in 96 per cent of the fields surveyed. There was an average of 9.04 per cent infection.

Glume blotch (Septoria nodorum) was more severe than for several years. It was found in each of the seventy-two fields surveyed. An average of 31.3 per cent of the spikelets were infected. The maximum infection in one field was 90 per cent of the spikelets.

Powdery mildew (Erysiphe graminis) was not as severe as usual. It was found in 16.6 per cent of the fields. The average infection was 0.9 per cent.

BARLEY. Loose smut (Ustilago nuda) has been on the increase since winter barley was generally introduced into Pennsylvania. It was found in 100 per cent of the untreated fields surveyed. The maximum found in one field was 28 per cent.

Occurrence of Loose Smut.

Percentage in 44 untreated fields 4.58.
Percentage in 4 fields planted with seed one year removed from treatment 0.402.
Percentage in 35 fields planted with seed treated with old Type Ceresan 0.61.
Percentage in 16 fields planted with seed treated with New Improved Ceresan 0.256.
Percentage in 3 fields planted with seed treated with formaldehyde 2.2
Percentage in 3 fields planted with seed treated with Copper Carbonate 2.0.

(R. S. Kirby and G. L. Zundel).

Covered smut (Ustilago hordei). There was less covered smut than there has been since winter barley was generally introduced into the State. In the forty-four fields that had been planted with untreated seed covered smut was found in 93.per cent. The maximum found in one field was 23 per cent.

Average percentage in 44 untreated fields 7.62.
Average percentage in 4 fields planted with seed one year removed from treatment 0.
Average percentage in 35 fields treated with old Type Ceresan 0.05.
Average percentage in 16 fields treated with Improved Ceresan 0.3.
Average percentage in 3 fields treated with formaldehyde 3.74.
Average percentage in 3 fields treated with Copper Carbonate 4.3.

(R. S. Kirby and G. L. Zundel).

Leaf rust (Puccinia anomala) was more severe than usual on winter barley. It was found in 52 per cent of the fields surveyed. The average percentage of infection was 2.3, the maximum 10.

Scab was found in 17.3 per cent of the fields surveyed. The average percentage of infection was 0.015. The maximum infection in one field was 2 per cent.

Net blotch (Pyrenophora teres) was rather scarce in Pennsylvania. It was found in 17.3 per cent of the fields. The average infection was 0.049 per cent. The maximum infection in one field was 2 per cent.

Stripe (Helminthosporium gramineum) is yearly becoming more severe in winter barley. It occurred in 9.1 per cent of the untreated wheat fields surveyed. The average infection was 0.49 per cent. The maximum infection in one field was 20 per cent. No stripe was found in the thirty-five fields surveyed that were treated with Old Type Ceresan and only a trace in one field out of sixteen that were treated with the New Improved Ceresan.

(R. S. Kirby and G. L. Zundel).

Spot blotch (Helminthosporium sativum). The average infection of spot was twice as severe as in 1933. All of the sixty-four fields surveyed for this disease were infected. The average percentage was 11.1, the maximum was 20.

Powdery mildew (Erysiphe graminis). There was slightly more powdery mildew than in 1933. It was found in all of the sixty-four fields surveyed for this disease. The average infection was 17.1 per cent. The maximum infection in one field was 60 per cent.

CEREAL DISEASES IN WISCONSIN

Reported by R. E. Vaughan (July 12)

Very little loss is expected from stem rust (Puccinia graminis) as grains will mature before it can do great damage. V. O. Taylor, in charge of barberry eradication, reported rust on barberry bushes in Waukesha, Dane, Winnebago, Monroe, and La Crosse Counties. Definite spread from barberry to barley was noted in Waukesha County. Very little leaf rust is reported on cereals. Late oats may be damaged later.

One field of oats was found in Waukesha County with 10 per cent smut (Ustilago avenae and U. levis), but most fields have only traces. There is less smut than there has been for several years.

As usual, there is a very small amount of covered smut (Ustilago hordei) on barley. One field in Ozaukee County with 2 per cent infection is reported. Scab (Gibberella saubinetii) on barley is just getting started, following heavy storms. It is impossible to estimate the loss yet.

BACTERIAL WILT OF CORN IN KENTUCKY

In a field of Country Gentleman corn one foot to eighteen inches tall, about one sixth of the plants are affected with bacterial wilt (Aplanobacter stewartii) and will die. Many others are affected but look as though they might produce a crop. The soil is very dry. It has been rather cool for the past several days. (W. D. Valleau, May 31).

EFFECTS OF DROUGHT AND DISEASES ON WHEAT IN MONTANA

Reported by P. A. Young (June 28).

Drought killing and border effect due to extreme drought with hot weather. Turkey wheat in dry-land experimental plots of Mr. Arthur Seamans on the experiment station at Huntley, Montana. The centers of these plots were entirely dead and brown, with wheat only 3 to 8 inches tall, while the border of each plot was conspicuously taller, with only part of the wheat plants dead. Wheat in these plots showed some foot rot, which probably reduced the resistance of the wheat to the extreme drought there. The borders of the plots secured extra water from the adjacent roadways that were fallowed. (June 13).

Heads stuck in boots due to extreme drought. In Yellowstone and Gallatin counties, some Turkey wheat showed the tips of the heads remaining attached to the boots while the bases and central parts of the heads bent out from the boots. This symptom was seen in wheat only 6 to 12 inches tall, due to dwarfing by foot rots and drought. (June 13 and 19).

Blast due to heat and drought as heads emerge. I never saw this abnormality before, except in a few heads in spring wheat at Havre in 1930. This year, many fields of winter wheat near Great Falls, Fort Benton, Billings, and Columbus show 5 to 30 per cent of the tips of the heads blasted, with white, ripe-position awns, and white, non-blooming, shrivelled, conspicuous spikelets composing the upper one-fifth to one-third of the heads. Only the awns were affected on some heads, but the damage is serious in other fields. I expect it to reduce the yields about 5 per cent in some fine fields that promised to yield nearly 25 bushels per acre near Great Falls. Severe blast was associated with foot rots in some fields. (June 1 to 12).

Bunt (Tilletia levis) in winter wheat at Columbus in a twenty acre field of Turkey Red wheat, 8 per cent of heads bunted; twenty acres of Newturk wheat, 1 per cent of heads bunted. Dean Clyde McKee reported a field of wheat with about thirty-five per cent of the heads bunted, near Square Butte. These are unusually early records for wheat bunt in Montana. (June 14).

Loose smut (Ustilago tritici). Great Falls, 160 acres, 0.5 per cent of heads smutted, wheat in bloom. Karmont variety? This is the first serious damage to winter wheat done by loose smut, according to my memory of conditions in Montana. (June 10).

Leaf rust (Puccinia triticina). No rust seen in wheat fields inspected near Great Falls, Fort Benton, Square Butte, Moccasin, Lewiston, Billings, and Columbus. Thus, dry range wheat is unlike the wheat of Illinois in which red rust usually is present and often is destructive; the difference probably is due to difference in water on the wheat leaves in these contrasted regions. (June 9 to 14).

Foot rots (Helminthosporium and Fusarium). Serious and destructive in winter wheat as associated with drought in region of Great Falls, Fort Benton, Lewiston, Billings, and Columbus, Montana. (June 12).

FLAG SMUT SURVEY IN ILLINOIS

A limited survey of wheat fields for flag smut (Urocystis tritici) was made May 24 to 26, 1934, by A. G. Johnson, U. S. D. A., Division of Cereal Crops and Diseases, P. A. Glenn, Illinois State Department of Agriculture, and B. Koehler, Illinois Agricultural Experiment Station. Special attention was given to the former quarantine area (1919-1923) where flag smut had been very bad. Eight fields were examined in Logan County, no flag smut found; twenty-nine fields in Madison County, three infected with flag smut; and forty fields in St. Clair County, two infected with flag smut. Prevalence in each case was less than 1 per cent. (Benjamin Koehler, June 1).

FRUIT DISEASES IN WEST VIRGINIA

The following summary of disease conditions as affecting fruit crops in the Panhandle section of West Virginia is by F. J. Schneiderhan (June 4).

APPLE. Compared with 1933, the present season has been highly unfavorable for the development of apple scab (Venturia inaequalis). Subnormal rainfall during May is the factor determining the present light infection as compared with heavy rainfall in 1933. In sprayed orchards, and that includes all commercial orchards, there is only a trace of scab to date. Ascospore differentiation was unusually late this season which accounts for the light discharges in the rains of the latter weeks of April. One of the heaviest spore discharges recorded occurred on May 25, but this discharge will probably not cause much infection because the growers had sufficient time to apply the spray. From the standpoint of the apple growers, the scab situation at the beginning of June appears to be highly favorable.

The lack of rain was an unfavorable factor for cedar rust (Gymnosporangium) infection in 1934. In the commercial apple sections of this State and in Virginia, most of the cedar trees have been destroyed. However, a recutting will be necessary during the next few years because numerous cedar seedlings have been growing in the cutover areas. Cedar rust since the cedar eradication campaign has not been a serious factor in apple growing but previous to this cutting it was the limiting factor.

Frogeye (Physalospora obtusa) appears only in unsprayed or very poorly sprayed orchards. Infection is sharply localized, occurring beneath cankered twigs or limbs.

PEACH. As the result of the epidemic of leaf curl (Exoascus deformans) that caused very serious damage in 1933, most of the peach growers sprayed to control the disease during the past winter. The result is a great reduction in the occurrence of the disease in 1934. There is nearly a complete peach crop failure in eastern West Virginia this year as the result of the lowest February temperatures on record.

FRUIT DISEASES IN TENNESSEE

Brown rot of plum (Sclerotinia fructicola) seemed to be severe and general in Weakley and Henry Counties. One 25-acre apple orchard had practically 100 per cent scab (Venturia inaequalis) on the fruit of the red Delicious variety at McKenzie, Tennessee. Blight (Bacillus amylovorus) had caused the limbs of eight pear trees to be completely blighted to the trunk in Weakley County. This disease seemed to be much more severe in this region than it had ever been observed before by the orchardists. Apple rust (Gymnosporangium juniperi-virginianae) seemed to be general in all orchards observed in West Tennessee, but the infection was scattered. (Paul R. Miller, July 14).

SOME DISEASES OF VEGETABLE CROPS IN WISCONSIN

Reported by R. E. Vaughan (July 12).

Yellow Dwarf of Potato (Virus): Specimens from Buffalo and Portage Counties. Specimens in trial plots at Madison carried from seed in 1933 raised in Portage County. Experimental work is being continued by Dr. Walker and Dr. Koch.

Bacterial Blight of Bean (Bacterium phaseoli): Specimens received from Dane, Columbia, and Shawano Counties. Widespread infection evidently just starting.

Cabbage Yellows (Fusarium conglutinans): Specimens received today from Brown and St. Croix Counties. This is outside the generally recognized area of yellows infection. Yellows in Washington County doing considerable damage.

Scab on Radish (Actinomyces scabies): Most susceptible varieties are Saxa and Scarlet Globe. Resistant varieties are White Tip, Crimson Giant, and Icicle. Seeded in early May. Disease observed in 30 to 40 days.

VARIOUS REPORTS ON DISEASES OF TRUCK CROPS

LEAF VARIEGATION OF BLAKEMORE STRAWBERRY IN MARYLAND: During the past two weeks I inspected strawberry fields on the Eastern Shore. The leaf variegation in the Blakemore variety is on the increase, some fields set out this spring having as high as ten per cent of the plants affected. (J. W. Heuberger, July 2).

SOUTHERN BLIGHT ON TOMATOES AND STRAWBERRIES IN NORTH CAROLINA: A serious case of southern blight of tomato caused by Sclerotium rolfsii was brought to my attention recently by a grower at Chadbourn. One half of a field of about two acres is practically a total loss with nearly all the plants dead or dying. This half is on the lower part of the field. The other half is not so badly affected, but dead and dying plants are scattered all through it. This part was planted to tomatoes last year, but the grower did not see any injury from this disease. However, last

year the earth was ridged up rather high around the stems of the plants while this year it is practically level; this may have caused the top layer of the soil to be rather dry last year, thus not favoring the development of the fungus. The entire field is planted with the Pritchard variety. The stems at the surface of the ground are covered with a weft of mycelium and sclerotia. (Specimen sent with report).

Sclerotium rolfsii is found occasionally on strawberries, but so far it has not caused much loss in this section. (G. A. Meckstroth, July 11).

WESTERN YELLOW BLIGHT ON TOMATOES IN WESTERN OREGON: Curly-top disease, which on tomatoes is commonly called western yellow tomato blight, has definitely appeared this year in most parts of western Oregon for the second time in recent history. In 1926 curly top appeared in the Willamette Valley after continued east winds which are believed to have aided the migration of the leaf hopper insects which carry the virus of the disease.

Just what conditions have favored the migration of the insects across the mountains this year are not fully known, but it is known that there has been a rapid build-up of numbers of the hoppers through the early spring and that migrations seem to be induced by such rapid increases in numbers. (From the Corvallis (Oregon) Gazette-Times, July 6).

STEM ROT OF SWEET POTATO IN TENNESSEE: During last week's survey in west Tennessee I made counts of diseased sweet potato plants in Weakley County. This county, I understand, is the second county in the United States in sweet potato production. Apparently stem rot (Fusarium spp.) is more severe this season than for many years. I made counts in fields representing about 500 acres, and the average loss from this disease was about 25 per cent; in some fields it ran as high as 65 per cent. I only observed two fields, each of ten acres, where certified seed had been used, and in this case the loss was about 2 per cent. In one field the seed was certified and had been treated for black rot, and I was unable to find any stem rot there. The above estimate was on the Nancy Hall variety. (Paul R. Miller, July 14).

ONION MOSAIC IN KENTUCKY: A specimen of "potato onion" (Allium cepa var. solaninum) affected by mosaic was received from Dunraven, The disease seems to be quite common in potato onions as specimens have been received from other sections, similarly affected. (W. D. Valleau, May 31)

BLACK ROT OF RADISH (Pythium aphanidermatum) IN MASSACHUSETTS: Severe infection of the roots of an extensive planting in Agawam (Hampden County). Field rather low and retentive of water. Weather has been unusually rainy this spring. (O. C. Boyd, June 20).

SOLUBLE SALT INJURY TO GREENHOUSE CUCUMBERS IN NEW YORK: A rather sudden wilting, browning, and drying up of the leaves of bench-grown cucumber vines in their sixth week of picking occurred recently in a prominent Elmira greenhouse. The trouble was characterized by the dessication of the tissues between the veins, and at the margins of the leaves, and by the death of fine feeding rootlets, coupled with generally dark color of the healthy leaves.

The trouble was initiated by extra applications of soluble commercial fertilizer and was aggravated by the difficulty experienced in maintaining adequate soil moisture on some of these benches. This in turn was due to the way the soil was hoaped up to the top of the benches which were not very deep. The loss was not over 10 per cent. (A. G. Newhall).

ROOT KNOT NEMATODE POPULATION IN NEW YORK REDUCED BY COLD WINTER

A. G. Newhall

Heterodera marioni has been on the increase in the mucklands of New York the past few years probably due to the higher average temperatures which were experienced in the northeastern part of the United States. This was recently pointed out by N. E. Stevens in a recent issue of the Plant Disease Reporter. But last winter's low temperatures evidently reduced their numbers considerably in some places. Godfrey has shown that all stages are killed in a few hours at a little below zero Fahrenheit. The air temperature remained under 15 below for 24 hours on at least one occasion last winter in many parts of the State. No records of soil temperatures are available. Samples of muck from a badly infested field in Oswego County brought to the greenhouse in April and sown to squash were apparently free from living nemas as no galls developed in eight weeks time on the squash roots.

It should not be concluded from this, however, that all Heterodera has been killed out in New York State. There were many places where a rather heavy blanket of snow covered the ground during the coldest weather. Also different weather stations reported widely differing temperatures for the same cold periods. In the southern part of the State it is doubtful if low enough temperatures were reached in the ground to do any good and reports have come in from several counties that galls have been found on seedlings grown in more or less sheltered seed beds.

It is to be hoped, however, that on the whole the nematode population has at least been reduced to normal proportions again in the northern counties where it was threatening to handicap the growers of celery, lettuce, and onions on the mucklands in several counties. (July 3).

COTTON DISEASES IN TENNESSEE

Reported by Paul R. Miller (July 7)

A "new disease" of cotton was reported in a letter from a cotton grower at Somerville, Fayette County. A visit to the region disclosed a severe epidemic of angular leaf spot (Bacterium malvacearum). This disease has probably been present every year, but apparently this is the first time that it has caused severe damage. About three weeks ago there was a long heavy downpour of rain accompanied by wind and followed by high temperatures. With these favorable conditions for the spread of the disease, all of the lower leaves became infected and dropped off and in

many cases all of the leaves are infected and also the bolls. The disease is apparently more severe in Fayette County, but I have also found it in Madison, Lake, Weakley, Gibson, and Obion counties.

Three per cent of the cotton plants in a forty acre field in Lake county were found to be infected with wilt due to Verticillium alboatrum. In a twenty-acre field in Crockett county one per cent of the plants were affected by wilt caused by Fusarium vasinfectum.

DIE BACK OF CAMELLIA

Thelma B. Post

During the month of June several specimens of Camellia twigs showing a die-back condition were received. The ends of the twigs and the terminal leaves were withered and black. On one specimen from Savannah, Georgia, received June 8, 1934, Gloeosporium (Glomerella cingulata?) was fruiting abundantly on both twigs and leaves. An unidentified ascomycete with asci containing 8 two-celled, four guttulate greenish, hyaline spores and club shaped paraphyses, was present on the twigs. Inoculations with the Gloeosporium showed that it was pathogenic, but the results of the test with the ascomycete were negative.

Anthracnose of Camellia caused by Gloeosporium has previously been reported from Mississippi, while Glomerella cingulata on this plant has been reported from South Carolina.

Although weather conditions, (intense heat, following a period of rapid shoot growth), are believed to have influenced the occurrence of this die back of Camellia, it seems probable that infection by the Gloeosporium was a contributing and perhaps a primary factor.